CLAIMS

1   1.   A spread spectrum radio frequency communication system comprising:

2   a Forward Error Correction (FEC) algorithm to encode digital data to provide a plurality

3   of symbol groups;

4   an interleaving algorithm to map each one of the plurality of symbol groups into a

5   corresponding one of a plurality of coherent subbands; and

6   a Walsh subband encoder to encode each one of the plurality of coherent subbands.

1   2.   The communication system as recited in Claim 1 wherein the FEC algorithm uses a Reed

2   Solomon FEC code.

1   3.   The communication system as recited in Claim 1 wherein the FEC algorithm uses a Turbo

2   Code FEC code.

1   4.   The communication system as recited in Claim 1 wherein the FEC algorithm uses a

2   convolution FEC code.

1   5.   The communication system as recited in Claim 1 comprising a transmission security device

2   to encrypt each one of the Walsh encoded symbol groups.

1   6.   The communication system as recited in Claim 5 comprising an Inverse Fast Fourier

2   Transform (IFFT) coupled to the transmission security device.

1   7.   A method for reducing transmission interference with other wireless communications

2   systems comprising the steps of:

3   inserting zero amplitude weights in at least one of a plurality of narrowband frequency

4   subbands; and

5   spectrum tailoring each one of the plurality of the transmitted narrowband frequency

6   subbands to any available frequency allocation to remove undesirable interference.

1   8.   A method for reducing receive interference from other wireless communications systems

2   comprising the steps of:

3   detecting and erasing corrupted data in at least one of a plurality of received narrowband

4   frequency subbands having .

1   9.   A method for reducing receive degradation due to multipath fading comprising the steps

2   of:

3   detecting and erasing faded data in at least one of a plurality of received narrowband

4   frequency subbands.

1   10.   A method of providing a spread spectrum radio frequency communication signal

2   comprising the steps of:

3   forming a stream of data into a plurality of data packets;

4   embedding each data packet into a physical layer packet comprising the steps of adding a

5   packet header, performing a cyclic redundancy check and encoding the data;

6   the encoding the data step comprising the steps of:

7   encoding baseband data with a Reed Solomon forward error correction algorithm

8   to provide RS symbols; and

9   interleaving the RS symbols across a plurality of coherent subbands; and

10   subband-encoding each coherent subband with a low rate Walsh code.

1   11.   A spread spectrum radio frequency communication system comprising:

2   a Forward Error Correction (FEC) algorithm to encode digital data to provide a plurality

3   of symbol groups, the FEC algorithm using a Reed Solomon FEC code;

4   an interleaving algorithm to map each one of the plurality of symbol groups into a

5   corresponding one of a plurality of coherent subbands;

6   a Walsh subband-encoder to encode each one of the plurality of frequency subbands.

1 12. The system as recited in claim 11 further comprising:

2   a transmission security device to encrypt each one of the Walsh encoded symbol groups;

3 and

4   an Inverse Fast Fourier Transform (IFFT) coupled to the transmission security device.

1 13. The system as recited in claim 11 further comprising a subband filter to excise a frequency

2 subband to prevent co-site interference with another radio system.

1 14. The system as recited in claim 13 further comprising a corresponding receiver having a

2 subband filter to excise the corresponding frequency subband as in the transmitter.

1 15. The system as recited in claim 14 wherein both the transmitter and receiver perform

2 different subband mapping that avoids mapping symbols into excised subbands.